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**ABSTRACT**

The subject of the present invention is a method of preparation of a monolithic hydrated alumina by the oxidation of aluminium or an aluminium alloy in the presence of a mercury amalgam that contains at least one noble metal, such as silver. This hydrated alumina serves *inter alia* as base product in methods of preparation of amorphous or crystalline aluminas, or of aluminates, which themselves serve as base products for methods of preparation of composite materials based on oxides, on metals, on carbon products and/or on polymers. Application of the said products obtained by the said methods in many fields, such as catalysis, thermal and acoustic insulation, magnetism, waste storage, and preparation of radioelement transmutation targets.